SITE: Florida Phosphate
BREAK: 10.1
OTHER: V.1

Brad Jackson

04/24/2003 11:41 AM

To: Carol Monell/R4/USEPA/US@EPA, Jim McGuire/R4/USEPA/US@EPA, Mike Stephenson/R4/USEPA/US@EPA, Jon Richards/R4/USEPA/US@EPA
cc:
Subject: Initial Review of "Indoor Radiation Exposure Due to Radium-226 in Florida Phosphate Lands"

Here's some initial comments from Loren on is review of the 1979 report. We can discuss more at 1pm.

Thanks, Brad

----- Forwarded by Brad Jackson/R4/USEPA/US on 04/24/2003 11:40 AM -----

Adam Klinger

04/24/2003 11:23 AM

To: Brad Jackson/R4/USEPA/US@EPA
cc: Loren Setlow
Subject: Initial Review of "Indoor Radiation Exposure Due to Radium-226 in Florida Phosphate Lands"

What follows are Loren's comments on the Feb., 1979 Study "Indoor Radiation Exposure Due to Radium-226 in Florida Phosphate Lands." Loren argues for the continued pursuit of the survey initiatives previously presented, and articulates some concerns he has with the historic study. Please keep us in the loop as things evolve and let us know how we might help in these efforts. Thanks.
-- Adam

Brad,
Thank you for bringing this to my attention. I was aware of some earlier studies and had mailed at least one to you (1975 vintage I recall). While the 1978 document may be a guide to what might be found today, I do not believe it is appropriate to abandon the current, methodical approach or substitute the old findings for a modern effort.

I tracked the report down-its date is 1978 (do you have a copy?). The study is interesting but severely dated and incomplete, covering only one of the four producing counties (Polk). Accuracy of the radon and gamma measurement devices used for that study are worth re-examining (some discussion would be warranted with Jon or Rick). The radon issues being explored were prior to the development of EPA radon guidance, and we have significantly lowered the recommended maximum exposure levels to other ionizing radiation for members of the public since that report. Additionally, there have been important changes in dose factors, particularly for women and children.

Radon, as you recall is probably the highest contributor to risk in the houses overlying mineral or reclaimed phosphate lands. EPA guidance is that homeowner efforts should be taken to reduce radon below 2 pCi/l (about 0.01 WL), but that a reading of 4 pCi/L (0.02 WL) is considered an action level for fixing a home. Lets assume for this discussion that the 1978 numbers were reliable. From this limited EPA study of Polk County (Table 2, page 25) , 35% of the homes tested had indoor radon levels >.01 to .03 WL of radon; more significantly, a greater percentage of homes overlying reclaimed lands had levels ranging from 0.03 up to 0.05 or higher, than even homes overlying mineralized lands. The radon study covered only 122 houses. If we were to extrapolate this unstatistical sample to lets say 5000 houses, and look only at homes on the reclaimed lands, then radon remediation would be required for 18% of those houses = 900. Note that the highest radon levels in houses on reclaimed land from this old study exceeded 0.05 WL (more than double the current action level for radon).

The track etch data supported a similar kind of correlation, that a large percentage of homes over reclaimed lands (35%) had high levels of radon, particularly in the 0.03 to 0.05 and greater than 0.05 WL

categories. The small numbers of homes over the mineralized lands for that piece of the study would probably not be a statistical control, even for that time.

With respect to gamma measurements, I didn't see any numbers for indoor measurements, just conversions for outdoor numbers (appendix D) and some estimates of what the radiation levels might be over the different types of flooring. I found the analysis interesting, but don't believe there is enough data in the report to substitute that study for a survey of current housing overlying the reclaimed lands, or to estimate how many houses exceed the 20 microR action level. We have no idea what the risks are to children at these sites who may very well spend a good bit of time in their yards exposed to (and ingesting) the contaminated soil.

Additionally, the risk analysis is quite rudimentary and would not meet today's standards. The economic evaluation was done in the days prior to passage of CERCLA. Excavation of dirt under homes, removal of front yard soil, and the like has been done by PRPs at other former mine sites in the U.S. where homes now stand (Butte MT is a good example).

I hope this review has been useful. I would urge you to continue your discussions with Jon and Rick, as well as the appropriate staff in DC such as Stuart and Joan, and I am certainly available as well.

Regards,
Loren
Brad Jackson

Brad Jackson
04/15/03 12:49 PM

To: Loren Setlow/DC/USEPA/US@EPA
cc:
Subject: Florida Phosphate Initiative

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Loren:

Sorry I have not gotten back you yet on our State meeting. Overall, I think we had a good meeting everyone was very receptive. The main surprise from the meeting was the identification by the Florida Dept. of Health of a study that the EPA Office of Radiation Programs conducted in the mid 1970's titled "Indoor Radiation Exposure Due to Radium-226 In Florida Phosphate Lands" (1970) (EPA520/478-013). The study measured radon and rad levels in side and out side of about 1100 homes in areas overlying former mines, non-mine land, and ore-deposits not yet mined.

In general, the report indicated levels about half as high as what we saw at the Borden Chemical mine we investigated. The report did say that it did not include anomalously high levels and at Borden we may have biased the study towary IDing the high levels...that may explain the differences. In short, the report concluded that concrete slabs offer significant shielding from the gamma radiation. It recommended that new construction over formerly mined land include slab foundations in the construction (the risk level, however, was still about 1x10-3 even with the slab). The report also concluded, however, that retrofitting homes that may have been built w/o slab foundations would not be cost-effective.

I was wondering if you were aware of this study and what your thoughts might be. The FDOH clearly believes that this answers all of our questions/concerns and that no additional CERCLA work is needed by EPA. Certainly we could adopt this view, but it would require several assumptions 1) that the study's representativeness still holds for today, given the increase in development from about 1000 acres measured to about 20,000 acres of developed land today; 2) that the predominately used slab

construction technique is an adequate solution for those homes with elevated levels and that it would not be cost effective to try and reduce risk at homes that may not have used slab construction; 3) the predominate exposure would occur in the homes and elevated levels in the yards would not be of concern.

Alternatively, we could continue with the study as planned, but this would likely yield a significant problem to address for which there are no easy answers.

We're still discussing on this end and don't have any answers yet...I was mainly interested in if you were aware of the report and what you thought about it. If you would, please don't circulate this. I want to make sure our Div. Dir. has an opportunity to formulate a position and then I would assume we would brief HQ again on our revised approach before implementing.

Thanks for the help.

Brad